

VASOPRESSIN AND CHANGES IN THE LIGHT/DARK CYCLE

Cyrilla H. Wideman, Helen M. Murphy, and
George R. Nadzam

Departments of Biology and Psychology
John Carroll University, Cleveland, OH 44118

Telemetered body temperature (BT), heart rate (HR), and activity level (AC) data were collected from vasopressin-deficient (DI) and vasopressin-containing (LE) rats. The animals were maintained in a 12 hour/12 hour light/dark cycle (zeitgeber for the photic oscillator) and were subjected to a restricted-feeding period (zeitgeber for a nonphotic oscillator), which commenced either at the second hour of the 1) dark cycle or 2) light cycle. After the circadian rhythms were well established, a 6-hour phase advancement of the dark cycle was introduced. The nonphotic zeitgeber was shifted in synchrony with the photic zeitgeber. With feeding in the dark, the natural nocturnal rhythms of BT, HR, and AC were maintained in both strains following phase advancement. However, with feeding in the light, dramatic changes were observed in both DI and LE animals following phase advancement. While DI rats synchronized to the nonphotic zeitgeber of food presentation, LE rats lost a well-defined circadian rhythmicity. Results demonstrate that vasopressin has a major influence on the photic oscillator, which is obvious only when the photic and nonphotic oscillators are uncoupled.

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